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Comparative study of dependency assessment scales, KATZ and SMAF, on the care of elderly people in care institutions

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Abstract

Background and aims: According to KCE (Federal Centre of Expertise for Healthcare) report 73B, SMAF (Functional Autonomy Measurement System of the Elderly), a tool for functional dependence of the elderly, little known in Belgium, offers better support from supervisory staff in care institutions. The study aims to assess the dependency of the elderly by the workload of the supervisory staff using the SMAF scale; and to demonstrate the impact of the use of the SMAF scale in Belgium for better financing of residential establishments for the elderly by supervisory staff.

Methods: We experimentally verified this statement in a nursing home and nursing home (n=50) by making comparative evaluations between the Katz and SMAF tools; the first being the normative reference for financing in management personnel in Belgium.

Results: At the end of our experiments, we arrived at a first result according to which SMAF, with more items, makes a better assessment of the dependency of the elderly compared to Katz. In addition to assessing activities of daily living (ADL), SMAF also assesses activities of domestic tasks (ADT). The items assessing cognitive abilities are more extensive than the Katz scale. In view of the results obtained, we reached a second result according to which the use of the SMAF scale in Belgium could be a good calculation basis for financing of paraprofessional care staff. On the other hand, with regard to other care professionals (Nurses and Kiné-Ergo-Logo), no clear trend was observed.

Conclusions: we can say that SMAF is a good tool for assessing the dependency of the elderly. It can also be used as a basis for funding orderlies. As for other paramedical staff, we recommend working on a large sample.

Keywords: Elderly People; Assessment of Dependency; Health Economics; Institution for The Elderly

1. Introduction

The flat rate provision of care on the basis of a dependency measurement scale in institutions for the elderly people is one of the variable forms of mechanisms for regulating health expenditure in Belgium [1]. The financing of these healthcare institutions is calculated on the basis of the Katz evaluation scale, the application of which makes it possible to define four types of packages (O, A, B and C) according to the physical capacities of the patient to assume certain tasks of daily life. Two types of additional packages (Cd and D) make it possible to determine the patient's cognitive capacity. A patient who reaches a minimum score of 3 is considered dependent for a criterion. The level of package is proportional to the person's degree of dependence.

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According to Iglesia et al [2], autonomy is defined as the ability to govern oneself. It presupposes the capacity for judgement, i.e. the ability to foresee and choose, and the freedom to act, accept or refuse according to one's judgement. Dependence is the partial or total inability of a person to carry out, without assistance, the activities of life, whether physical, mental or social, and to adapt to their environment. This freedom must be exercised in compliance with common laws and customs. A person's autonomy is therefore a matter of both capacity and freedom. Autonomy refers to the ability to make choices and manage one's own affairs. In the context of ageing, apart from dementia, dependence does not mean loss of autonomy [3].

According to Huisjman [4], in gerontology, the notion of "need" refers to a breakdown in the functional balance between a person or an elderly population and their living environment. This disruption requires a response and can be considered at three levels: that of the person or the elderly person, that of the person or the elderly person and that of the person's physical environment. Since it is difficult to objectify needs, we rely on an assessment of the degree of dependency using a validated scale [5].

The Katz evaluation scale is, however, very open to criticism for the following reasons

- The workload is not always linked to dependence [2]; in fact, the same category can correspond to two patients for which the workload will be fundamentally different;
- The nursing criteria relating to their different techniques (wound care, etc.) are not taken into account.
- In practice, in Belgium, the nursing staff of accommodation institutions for the elderly people has noticed that the criteria for assessing the dependency of an elderly person cannot be used to finance support staff. As a result, there would be a problem with the objectivity of the tool used to determine the number of nursing staff necessary for the daily care of people as a basis for financing institutions. Certain services increase the workload of nursing staff. This observation reveals the pressure to which staffs are constantly subjected given the additional workload they are obliged to support.
- The use of assessment tools of dependency for an elderly [2] person depends on the objectives pursued. These tools can, among other things, be used to:
- *Evaluate a person*. In this case, the tool used aims at detecting deficiencies and disabilities, establish a care plan to limit the disability, communicate with other health professionals and follow the person concerned over time;
- *Evaluate the care burden*. The organization of care requires adaptation to the dependency of the person being cared for. Nursing evaluation measures, for example, the time spent by caregivers for a person, or more broadly for a group of people within a functional unit, a department or an institution. There are time-consuming actions such as toileting or feeding aids, wound care, etc.;
- *Assess the cost of dependence*. Dependency generates a direct cost in technical aid that is most often easy to assess. On the other hand, the evaluation of indirect costs is more complex to assess, such as the impact of dependence on the immediate environment, the evaluation of human assistance involving natural caregivers or social actors. The difficulty increases depending on the multiplicity of participants. Social costs are borne by the person concerned or their family and, failing that, by communities, through social assistance.

SMAF (System for Measuring the Functional Autonomy) is a tool developed by Professor Réjean the needs of elderly people institutionalized or at home by measuring deficiencies, disabilities and handicaps [6].

This tool is designed based on the concept of disability and disability as described by the World Health Organization [7]. It assesses 29 functions distributed as follows

- 7 items covering Activities of Daily Living (ADL);
- 6 items on mobility;
- 3 items on communication;
- 5 items for mental functions;
- 8 items for domestic tasks.

It also includes a section allowing you to evaluate the resources in place to compensate for disabilities as well as the stability of these resources over the next three to four weeks. Each function of the SMAF is rated on a scale of 0 to - 3, according to precise criteria based on information obtained by a questionnaire, by observation of the resident and even, if necessary, by verification of their abilities. It is always important to corroborate the information collected from the resident by consulting their loved ones, because the person often tends to minimize their functioning problems, or simply not to recognize them.

The score 0 represents the autonomy of the old person, the score of - 0.5 means that the person is autonomous, but has difficulty carrying out the function, the score of - 1 means that the person requires supervision or stimulation to carry out the activity, the score of - 2 means that the person requires partial assistance to do the activity, and the score of - 3 means that the resident requires total help to do the activity.

It should be noted that the evaluator must decide on what the user does and not on what he could or should do. The SMAF is under copyright and cannot be used without the authorization of the Center of Expertise in Health of Sherbrooke/Canada [8].

The assessment makes it possible to group residents into 14 ISO-SMAF profiles classified according to the intensity and type of service required to maintain their autonomy [9]. It makes it possible to establish the number of staff members and hours of care necessary and to calculate allocation needs more equitably. The ISO-SMAF profile gives a global representation of the person's needs. The fourteen ISO-SMAF profiles are divided into five different categories each representing different disabilities and/or impairments, as shown in the figure below.

According to report 73B of the KCE (Federal Center of Expertise for Health Care) of 2008 [10], the SMAF (Measuring System of Functional Autonomy), a scale developed by the University of Sherbrooke in Canada with a recording duration of three quarters of an hour, is not really known in Belgium, but offers possible interest for financing to compare to other tools such as Belgium Geriatric Medical Screening Tools (BGMST), Comprehensive Geriatric Assessment (CGA), Resident Assessment Instrument (RAI) and Standardized Gerontological Assessment (SGA).

To date, no serious study has yet been carried out with the aim of investigating the affirmation of this KCE report. The objective of this work is to carry out a comparative study between two dependency assessment tools, namely: the Katz scale used in Belgium and the SMAF. According to Hébert et al [11], autonomy must be measured precisely by an instrument that generates a score with demonstrated test-retest and inter-rater reliability and low measurement error. As a result, the test-retest and interrater reliabilities of the SMAF are demonstrated [12]. In addition, several validity tests have been carried out, in particular a correlation study with nursing time which shows a coefficient of 0.92 with the number of nursing hours required.

The completion of this study allows us to formulate the following objectives

- To assess the dependency of the elderly by the workload of the supervisory staff using the SMAF scale;
- To demonstrate the impact of the use of the SMAF scale in Belgium for better financing of residential establishments for the elderly by supervisory staff.

With a view to experimental confirmation of the KCE's assertions [13], the use of SMAF in Belgium will have a threefold benefit, namely

- An improvement in the quality of work by increase in the number of management personnel and, consequently, by reducing the workload of the latter;
- The satisfaction of elderly people living in rest homes and rest and care homes following the improvement in the quality of their care charge and better supervision;
- An improvement in the level of financing and better functioning of rest homes and rest and care homes.
- Ultimately, at the end of this work, it will be appropriate to determine the conceptual added value of SMAF in relation to the scale from Katz or vice versa.

2. Methods

In order to assess the dependence of elderly people, we chose to use two tools for assessing functional dependence, namely, Katz (otherwise called appendix 41) and SMAF (training model) [14] while scrupulously respecting their user guides respective. These two tools were used for the assessment of residents living in a care institution for the elderly, Orelia-Ascot (an institution located in Flemish Brabant in Belgium), whose accommodation capacity is 52 approved beds with a occupancy rate of 96.15% (n = 50) at the time of our experiments.

The assessment of the dependency of the elderly people was optimized thanks to the particular professional title of nurse specialized in geriatrics (Ministerial decree of April 19, 2007 and published in the Belgian monitor of June 8, 2007) that we hold [15].

The initial assessments were scrupulously carried out by us. Their finalization is the work of a comparison of our own evaluations with the declarations of the healthcare professionals working in this institution. The evaluation of temporal, spatial and memory orientations which took place by interview in a relaxed atmosphere, was carried out using the *Mini Mental State Examination* (MMSE), an adaptation of the Dutch version Camdex [16] and the French-speaking version GRECO [17].

Categorization of nursing home residents or rest and care home was made after assessment of their dependence and on the basis of their respective medication treatment. The Care solutions IT platform for the Katz scale was associated with this. Residents in rest and care homes benefit from specific care requiring extensive care. Regarding SMAF, the Iso-SMAF profile and the categories are determined using an algorithm in the SMAF software [18]. The types of resources available to compensate for the incapacity of residents have been modified to respond to the operating context of rest homes and rest and care homes in Belgium. For this purpose, the term: "employee" (3) has been replaced by "cook"; "family assistant" (4) by "caregiver"; "other" (7) was identified as KEL (Physiotherapist-Occupational Therapist-Speech therapist) and "attendant" (8) was replaced by "cleaning lady".

All residents (n = 50) were freely consented to participate in this study which was carried out throughout the month of June 2020 both day and night. The case of refusal after reading the information letter to obtain informed consent was not observed. The protocol of this research received a favorable opinion from the Erasmus Ethics Committee of the Free University of Brussels in Belgium.

3. Results

As our study was carried out in Belgium where the Katz scale is used as a benchmark for funding staff framing for houses rest homes and nursing homes and care, we applied the standards of the INAMI (National Institute for Health and Disability Insurance) in this regard [19].

Tables 1 and 2 present the distribution of residents according to their specific capacity in carrying out daily life tasks.

Table 1 below presents all the results of the assessment of resident's disabilities on the basis of the different SMAF items. The total SMAF ratings per resident of this care institution range from - 15 to - 76. The most severe rating being - 87 representing a person who presents maximum disabilities at all levels (Activities of Daily Live-ADL, mobility, communication, mental functions and activities of Domestic Tasks-ADT for a resident. The ISO-SMAF profiles were obtained via SMAF using an integrated calculation matrix which locates the profile for each disability of the person assessed in relation to the 14 centroids of this multidimensional universe of disabilities [14]. It is the closest profile that is retained and the distance, called Euclidean distance (DE), is the distance calculated in relation to the centroid. It indicates the similarity between individuals. It is a statistical indicator that reflects the consistency or inconsistency of the set of evaluations. There is inconsistency when its value is greater than 5 and consistency when the value is less than 5 [20].

From what is said above, we see consistency in our evaluations based on the SMAF scale.

Table 1 The set of results from evaluation of inabilities of inhabitants on the basis of different items SMAF

Inhabitant	Total SMAF	Profile ISO-SMAF	ED	ADL	Mobility	Communication	MF	ADT
1	-43.5	9	2.92	-10.5	-10	-1	-2	-20
2	-76	14	2.17	-21	-13	-7	-12	-23
3	-50.5	8	3.69	-8	-8.5	0	-11	-23
4	-33.5	5	3.13	-6.5	0	0	-5	-22
5	-36	6	3.76	-7	-7	0	-2	-20
6	-52.5	9	3.98	-18.5	-11	-1	-1	-21
7	-49.5	10	3.30	-9.5	-6	-1	-11	-22
8	-27.5	5	2.64	-3	-1.5	0	-2	-21

9	-27	5	4.14	-6	0	0	-5	-16
10	-21	5	3.02	-3	0	0	-1	-17
11	-69	14	2.63	-21	-12	-2	-11	-23
12	-69	14	2.63	-21	-12	-2	-11	-23
13	-65	13	2.71	-21	-12	-2	-8	-22
14	-41.5	8	3.23	-6.5	-8	0	-5	-22
15	-52	9	3.97	-18	-11	0	0	-23
16	-32	5	3.94	-5	0	-1	-4	-22
17	-65	13	2.95	-21	-12	-2	-8	-22
18	-44	7	4.05	-10	0	-1	-10	-23
19	-42	8	3.47	-6	-5	-3	-5	-23
20	-38	8	2.85	-7	-5	0	-3	-23
21	-26	5	3.53	-6	-1	0	0	-19
22	-63	13	3.42	-20	-10	-4	-6	-23
23	-22	3	3.38	-3	0	-1	0	-18
24	-25.5	6	2.83	-3	-5	0	0	-17,5
25	-69	14	2.39	-21	-12	-3	-11	-22
26	-51.5	10	3.12	-11.5	-3	-1	-13	-23
27	-71	14	2.11	-21	-12	-2	-13	-23
28	-22	5	3.12	-3	0	0	-2	-17
29	-60	13	2.57	-18	-11	-1	-7	-23
30	-15	2	2.75	-1	0	0	0	-14
31	-63	13	2.12	-20	-11	-2	-7	-23
32	-46	9	3.74	-14	-7	0	-4	-21
33	-71	14	2.10	-21	-12	-3	-12	-23
34	-18	3	2.97	0	0	0	0	-18
35	-21	3	2.65	-3	0	0	-1	-17
36	-33	7	2.99	-5	-1	0	-6	-21
37	-27	6	3.16	-4	-4	0	0	-19
38	-34	7	3.10	-5	0	0	-7	-22
39	-62	12	2.51	-18	-8	-2	-11	-23
40	-45.5	8	3.96	-9	-3.5	0	-10	-23
41	-37.5	7	3.11	-8	-1.5	-1	-5	-22
42	-62	12	3.019	-16	-11	-2	-11	-22
43	-73	14	2.95	-21	-12	-3	-14	-23
44	-56	11	3.22	-16	-9	0	-8	-23
45	-19	3	2.94	0	0	0	-1	-18
46	-61	13	2.82	-19	-12	0	-8	-22

47	-44	9	3.87	-13	-6	0	-3	-22
48	-31	6	2.44	-4	-5	0	-1	-21
49	-40	8	3.59	-10	-3	0	-5	-22
50	-23	5	2.95	-4	0	0	-1	-18

Table 2 Presentation of residents according to their category/group and Iso-SMAF profile

Number of Residents	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Team	RH	RCH	RH	RCH	RCH	RCH	RCH	RH	RH	RH
Katz-INAMI	O	Cd	B	B	B	C	B	O	O	O
SMAF	9	14	8	5	6	9	10	5	5	5
Number of Residents	11	12	13	14	15	16	17	18	19	20
Team	RCH	RH	RCH	RCH	RCH	RCH	RCH	RCH	RCH	RCH
Katz-INAMI	C	Cd	Cd	B	C	B	Cd	B	B	B
SMAF	14	14	13	8	9	5	13	7	8	8
Number of Residents	21	22	23	24	25	26	27	28	29	30
Team	RCH	RCH	RH	RH	RCH	RCH	RCH	RH	RCH	RH
Katz-INAMI	B	Cd	O	B	Cd	Cd	Cd	O	Cd	O
SMAF	5	13	3	6	14	10	14	5	13	2
Number of Residents	31	32	33	34	35	36	37	38	39	40
Team	RCH	RCH	RCH	RH	RH	RCH	RH	RCH	RCH	RCH
Katz-INAMI	C	B	Cd	O	O	B	O	B	Cd	B
SMAF	13	9	14	3	3	7	6	7	12	8
Number of Residents	41	42	43	44	45	46	47	48	49	50
Team	RCH	RCH	RCH	RCH	RH	RCH	RH	RCH	RCH	RH
Katz-INAMI	Cd	B	Cd	Cd	O	Cd	B	B	B	O
SMAF	7	12	14	11	3	13	9	6	8	5

(RH: Rest Homme; RCH: Rest and Care Home)

Table 2 above presents all the residents evaluated by the Katz-INAMI and SMAF scales. This table gives us an idea of the potential concordance between the two tools used. We note that certain profiles are found simultaneously in several categories such as Iso-SMAF profiles 5, 7, 9, 10, 12 and 13.

Table 3 presents the distribution of Iso-SMAF profiles of residents by category of dependency.

Table 3 Correspondence between the categories/group and the profiles of all residents evaluated respectively by the Katz scale and the SMAF

Katz-INAMI	**O**	**A**	**B**		**C**	**Cd**	
	RH	**-**	**RH**	**RCH**	**RCH**	**RH**	**RCH**
SMAF	2-3-5-9	-	5-6-7-8-9-10-12	6-8	9-13-14	14	7-10-11-12-13-14

Table 4 Nursing staff supervision in full-time equivalent (FTE) per resident and by dependency profile according to INAMI standards. (-): not applicable

Category of residents	RH			RCH		
	Nurses	Nursing assistants	KEL	Nurses	Nursing assistants	KEL
O	0.1000	-	-	-	-	-
A	0	0	-	-	-	-
B	0.1400	0.2667	-	2.8333	2.9367	0.5667
C	0.1367	0.1687	-	0.5000	0.6200	0.1000
Cd	0.1367	0.2020	-	0.2333	3.1267	0.4667
Total FTE	0.5134	0.6374	-	3.5666	6.6834	1.1334

Table 5 shows the distribution of current management personnel compared to the standards imposed by INAMI. For information, the management present, that is to say the professional and para-professional workforce in activity, must always be higher than the standards imposed under penalty of lack of funding.

Table 5 *Number of care personal* in FTE and by professional team, with regard to norms of INAMI on the basis of evaluation in using scale of Katz-INAMI

	Nurses	Nursing assistant	KEL	TOTAL
Present care	7.25	8.6	1.5	17.85
Norms of care	4.0800	7.3208	1.1334	12.5342

Table 6 Distribution of median professional (Nurses and KEL), paraprofessional (nursing assistants) and care hours (Nurses + KEL + Nursing Assistants) necessary for the supervision of residents of Orelia-Ascot based on the SMAF scale

Profile	Number of residents	Percent	ILC sum	Professional hours (HP)	Paraprofessional hours (HPP)	Care hours (HS)
1	0	0.0	0.000	0.000	0.000	0.000
2	1	2.0	0.370	0.024	0.274	0.393
3	4	8.0	1.757	0.916	1.928	3.024
4	0	0.0	0.000	0.000	0.000	0.000
5	8	16.0	3.877	2.296	5.360	7.696
6	4	8.0	2.061	1.252	2.716	4.412
7	4	8.0	2.318	1.340	4.320	5.912
8	6	12.0	3.637	2.292	7.410	9.906
9	5	10.0	3.974	2.165	11.430	13.810
10	2	4.0	1.547	0.958	4.572	5.364
11	1	2.0	0.866	0.582	2.613	3.201
12	2	4.0	1.662	0.952	5.072	6.092
13	6	12.0	5.404	4.152	15.714	20.340
14	7	14.0	7.000	6.643	21.539	28.336
TOTAL	50	100	34.473	23.572	82.948	108.486

TOTAL FTE	3.102	10.914	14.274

Table 6 shows a distribution median hour of professional (HP), paraprofessional (HPP) and care (HS) necessary for the supervision of Orelia-Ascot residents based on the SMAF scale. The clientele heaviness index (ILC) of each profile is the division ratio between the hours associated with this profile and the hours of profile 14 [21]. It ranges from 0 to 1; 0 being the index of the lightest profile (profile 1) and 1 being the index of the heaviest profile (profile 14). The use of the client burden index allows a quick and simple assessment of the burden of care and services for a given sector. The hours represented in the table above have been calculated on the basis of 24 hours. For the sole purpose of having comparable results with INAMI standards, these hours have been converted into full-time equivalent (FTE). For this, the Orelia-Ascot residence like all private institutions, 1 FTE corresponds to 7.6 hours (7 hours 36 minutes) of work per day, that is to say 24 hours. The hours of work of management staff were expressed as medians according to the compilation of the Sherbrooke health center of expertise (CESS). According to the latter, medians are preferred to averages in all work on profiles. They are also used to calculate the ILC [22]. As shown in Figure 1 below, the distribution of care hours does not follow a normal distribution [23]. This also applies to professional and paraprofessional hours considered separately.

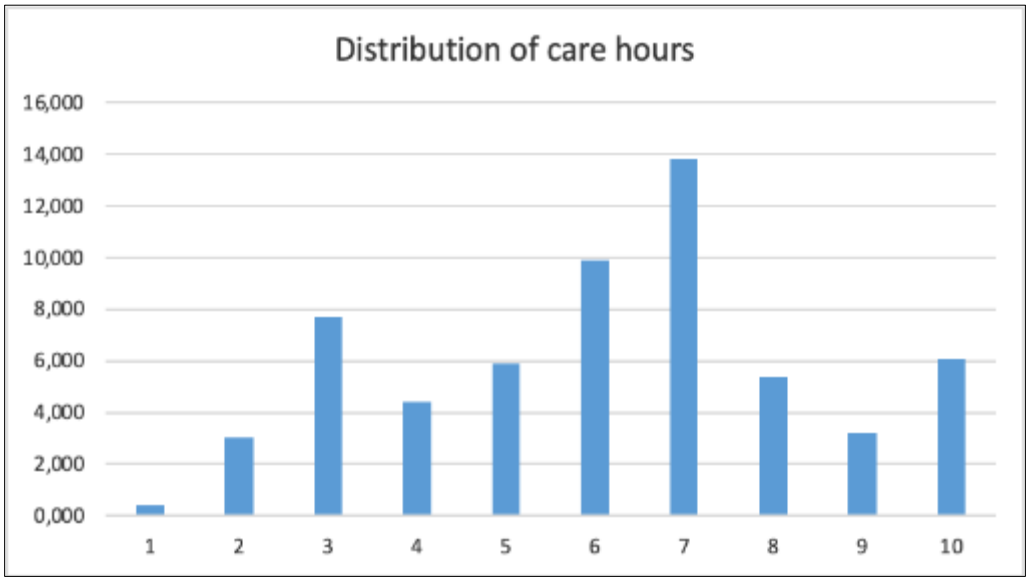

Figure 1 Distribution of care hours (professional hours and paraprofessional hours). We note that the excessive dispersion of the data is the logical consequence of the presence of outliers in the data set: the FTEs of profiles 13 and 14 are too high while the profiles 1 and 4 are not represented in the study population

Table 7 below presents a summary, in FTE, of the hours worked by all care management staff in this institution for the elderly analyzed.

Table 7 Distribution of hours of professional (Nurses + KEL) and paraprofessional (nursing assistants) care provided to residents of Orelia-Ascot based on the Katz and SMAF scales

	Nurse	**KEL**	**Nursing assistant**	**Total**
Katz-INAMI	4.08	1.13	7.32	12.53
MAF	3.1		10.91	14.01

It seems obvious to us to elucidate a certain number of considerations relating to hours linked to care (professional hours: nurses and KEL; and paraprofessional hours: Nursing assistants) as defined in table 6 presented above. All these hours are directly linked to compensating for the loss of functional autonomy of elderly people.

According to Hébert [14], for the purposes of calculating care hours, only the time dedicated to direct care and services to users by each personal category of care is considered. The time dedicated to direct care and services for the elderly corresponds to the time during which care staff (nurses, caregivers and KEL) provide care and services directly to

residents (e.g. nursing care, hygiene and comfort care, feeding assistance, etc.), or carries out another resulting activity (e.g.: note in the resident's file, updating of the therapeutic nursing plan, participation in meetings of the multidisciplinary or interdisciplinary team, etc.). Indeed, this excludes all so-called administrative tasks (for example: development of action plans, compilation and analysis of clinical-administrative data, schedule management, department meetings, supply management, etc.

Table 8 Comparative table representing the conceptual added value of SMAF compared to Katz. (-): non-existence of evaluation; (x): existence of eval

DIABILITY ASSESSMENT		**KATZ-INAMI**	**SMAF**
Activities of Daily Living	Feeding (Eat)	x	x
	Washing	x	x
	Dressing	x	x
	Self-care	-	x
	Bladder function	x	x
	Continence (bladder and intestinal function	x	x
	Going to the toilet (using the toilet)	-	x
Mobility	Transfer/movement and walking indoors	x	x
	Prosthesis or orthotics instalment	-	x
	Moving in a wheelchair indoors	x	x
	Using stairs	-	x
	Moving around outdoors	-	x
Communication	Seeing	-	x
	Hearing	-	x
	Speaking	-	x
Mental Functions	Memory	-	x
	Orientation (Time and space)	x	x
	Understanding	-	x
	Judgment	-	x
	Behaviour	-	x
Domestic Tasks (Activities of domestic life)	Maintaining hands	-	x
	Cooking meals	-	x
	Shopping (planning)	-	x
	Doing laundry	-	x
	Using the telephone	-	x
	Using means of transportation	-	x
	Take your medication	-	x
	Manage your budget	-	x

4. Discussion

The genesis of this research arose from the assertion of the KCE in its 73B report, according to which the SMAF scale is a little-known tool in Belgium, but offering possible interest for financing, to be compared to other tools such as Belgium

Geriatric Medical Screening Tools (BGMST), Comprehensive Geriatric Assessment (CGA), Resident Assessment Instrument (RAI) and Standardized Erotological Assessment (SEA).

On the other hand, in general, residents of nursing homes and nursing homes complain about the heavy workload experienced by nursing staff with the consequences of poor care and poor quality of care.

This research aimed to attempt to comment on the KCE's assertion; de facto, answer the two research questions; namely:

- Does the SMAF scale allow a better assessment of the dependency of elderly people, and does it therefore offer the possibility to better assess the workload of management staff?
- Would the use of the SMAF scale in Belgium allow better financing of accommodation institutions for the elderly in terms of management staff?

To achieve this, a comparative study was carried out in institution for the elderly in the rest home category and approved rest and care home for 52 beds, with an occupancy rate at the time of our experiments of 96.15% (n = 50).

As said above in the section introduction to this work, autonomy refers to the free will of the person while dependence is defined by the need for help. These two notions are complementary and not opposed and are taken into account to satisfy the care needs of an elderly person.

Thus, we distinguish two main forms of dependence: the loss of functional capacities hindering the usual tasks of life and the loss of autonomy psychic which manifests itself by a failure of intellectual functions. More explicitly, dependence is physical and/or mental while autonomy is mental.

As part of our study, we observed conceptual differences between the two scales, Katz and SMAF, which served as the basis for our work. A relevant and comparative analysis of the items assessed by the Katz and the SMAF is presented in Table 8.

In light of everything presented in these tables below, we can understand that the Katz scale essentially assesses the dependence of the elderly subject on the physical level; the assessment of mental function is limited only to time and space. However, the SMAF assesses physical and mental dependencies in a broader way. We can say conceptually that the Katz is the scale of daily life activities; the assessment of mental functions being minimalist while the SMAF is both a scale of activities of daily living and instrumental activities of daily living. Clearly, the SMAF is more suitable for assessing the real dependence of the elderly subject. Clearly, assessing the dependency of the elderly person using the Katz would amount to underestimating the real needs of the person concerned and the task carried out by the care staff.

To illustrate the statements presented above, we let's refer to table 3 presented above:

- Category O according to Katz, it includes residents deemed to be totally independent in carrying out daily life activities and are well oriented both in time and space. To this end, it is supposed to consume fewer hours of care from the staff of the supervisory institution. Unlike Katz, the same category is represented by several different ISO-SMAF profiles (2, 3, 5 and 9) consuming different hours of care.
- Category B, for its part, is represented in both the MR and MRS groups. Knowing well that the MRS group includes residents who consume more hours of care than the residents of the MR group, all things being equal, how can we explain that residents of Iso-SMAF profiles 9, 10 and 12 can be found in the group MR while they are non-existent in the MRS group.
- The reflection described above is also valid for the Cd category concerning the Iso-SMAF profiles 7, 10, 11, 12 and 13.
- Generally speaking, a category according to Katz includes several Iso-SMAF profiles.

From everything said above, we can say that the SMAF scale clearly offers a better assessment of the elderly compared to Katz. To answer our second research question, we should refer to the results presented in Table 10. This table presents the median workforce, in FTE, necessary for the care of elderly people assessed by the SMAF scale. We clearly notice a surplus of caregivers of 49%, or 3.59 FTE compared to the standards set by INAMI, according to our evaluations and a surplus of nearly 45.86%, or 3.43 FTE according to the evaluations of the accommodation center. It no longer needs to be clarified that the standards for nursing staff are set by assessing the dependency of elderly people using the Katz scale.

On the other hand, it is difficult for us to comment on the financing of care professionals, nurses and KEL. We believe that the size of the sampling was detrimental to the image of the results of the distribution of hours of care which does not follow the normal law (Figure 1). The Sherbrooke Health Expertise Center, generator of the SMAF scale, usually works with large samples (n> 100.000) [22]. Work to evaluate the dependency of elderly people was carried out in Bobo-Dioulasso (Burkina Faso) with a sampling of 351 elderly people [8].

As far as we are concerned, the size of the sampling constituted a size limit that could lead us to draw clear and precise conclusions on the potential of the SMAF scale for the financing of nursing homes and nursing homes and care in Belgium, especially for care professionals, namely nurses and KELs.

5. Conclusion

When carrying out this work, it was a question of analyzing the assertion made by the KCE in its report 73B, according to which the SMAF tool had an interest in financing management staff in rest homes and nursing homes. Rest and care in Belgium.

Experiments carried out on a population of 50 residents of a rest home and rest and care home in Belgium, the Orelia-Ascot residence, clearly show that the SMAF scale gives a better assessment of the dependency of elderly people. As a result, it better assesses the workload of nursing supervisory staff in view of a large number of items addressed compared to Katz. With the Katz scale, certain hours-consuming services performed by nursing staff are not evaluated, such as helping the elderly person to make telephone contact with their family by holding the telephone receiver during the conversation.

However, the response to the second research question referring to the financing aspect, the results of evaluations by SMAF mixed with regard to the activities of care professionals, namely nurses and KELs. For caregivers, the answer seems clear to us; SMAF offers more supervision than Katz. The additional nursing assistant FTEs to be financed will provide added value in the quality of care and care of residents. The latter will no longer see the caregivers rushing by claiming that they are overwhelmed, we will avoid untimely manipulations which could cause injuries. Ultimately, the workload will be reduced and there will be less and less talk of burn-out.

With regard to the group of healthcare professionals, namely nurses, physiotherapists and speech therapists, it is clear that funding more would be better for both them and residents. The time of care remains an essential time to continue taking the history. Today, healthcare professionals are botching their work a little, either by cutting short services or not providing them at all. In all cases, it is the residents who suffer. This is why it will be important to investigate a little more in the future, with a large sample, to see if SMAF really offered better financing than Katz.

Compliance with ethical standards

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Disclosure of conflict of interest

All authors declare no conflict of interest.

Statement of informed consent

All residents (n = 50) were freely consented to participate in this study which was carried out throughout the month of June 2020 both day and night. The case of refusal after reading the information letter to obtain informed consent was not observed. The protocol of this research received a favorable opinion from the Erasmus Ethics Committee of the Free University of Brussels in Belgium.

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Author contributions

This work is the fruit of my final year Master's thesis in public health. It draws on the knowledge I acquired during my specialist training in geriatrics and psychogeriatrics.

References

[1] Carbonnelle, S (2020). The reception of so-called 'autonomous' publics (O and A) in nursing homes: a contentious issue; The Observatory, 104 pages (35-40), 2020.

[2] Iglésias, A., & Da Costa Ribeiro, F (2017). From Dependency to Autonomy, a Geriatric Journey, in: Gerontological Care, 2017, 126, pp. 21-25.

[3] Grandemange, D., Gwladys, G. & Conchita, S (2010). The elderly, understanding and caring for them. Brussels: De Boeck, 2010

[4] Huisjman, R (2006). Assessment of care needs, in: Care for people with dementia in Belgium. Results and recommendations of the Qalidem study, Ylieff, M., De Lepeleire, J. and Buntinx, F., (Eds) Garant : Antwerp-Apeldoom, 2006, pp.1-102.

[5] Gommers, A., Dargent, G (1997). Dependency(ies): assessment measure and evaluation of measures, in: The Paradox of Old Age - Autonomy in Dependence, Meire, P., Neirynck, I. (Eds) De Boeck Université: Paris-Brussels, 1997, pp.57-80.

[6] Hébert, R (2019). User Guide for the Functional Autonomy Measurement System (SMAF). Sherbrooke Health Expertise Center, Revised June 2019.

[7] Dagneaux, I (2009). Autonomy, dependence, deficiency,… more than just words, In: Scales for taking care: Pebbles for fragile health. Louvain-La-Neuve: University Presses of Louvain, 2009.

[8] Berthé, A., Berthé-Sanou L., Konaté B., and al (2012). Functional disabilities in elderly people living at home in Bobo-Dioulasso, Burkina Faso. Public Health, 2012 ; 24 : 5 439-451.

[9] Tousignant, M., Dubuc, N., Hebert, R. and Coulombe, C (2007). Home-care programs for older adults with disabilities in Canada: How can we assess the adequacy of services provided compared with the needs of users? Health and Social Care in the Community, 2007, 15 (1), 1-7.

[10] KCE Reports 73 B. Funding for the geriatric patient care program in the conventional hospital, 2008.

[11] Hébert, R, Raîche, M, Dubois, MF, and al (2012). Development of indicators to promote measures for the prevention and rehabilitation of functional decline in older people, Journal of Epidemiology and Public Health, 2012, 60, 463-472.

[12] Hébert, R, Desrosiers, J, Dubuc, N, and al (2003). The Journal of Geriatrics, 2003, 4 323-336.

[13] Deschodt, M, Claes, V, and al (2015). Global Geriatric Approach: Role of Internal Geriatric Liaison Teams, KCE Report number 245Bs, 2015.

[14] Hébert, R (2019). User Guide for the Functional Autonomy Measurement System (SMAF). Sherbrooke Health Expertise Center, Revised June 2019.

[15] Ministerial decree of April 19, 2007 and published in the Belgian monitor of June 8, 2007

[16] Derix M., Hofstede A., Teunisse S, et al (1991). CAMDEX-N: The Dutch version of the Cambridge Examination for Mental Disorders of the Elderly with automatic data processing. Gerontol Geriatr, 1991 ; 22 143 - 150.

[17] Derouesné C., Poitreneau J., Hugonot, L. and al (1999). The Mini-Mental State Examination (MMSE): a practical tool for assessing the cognitive state of patients by the clinician. Med Press, Paris: Masson, 1999; 28: 1,141 - 1,148.

[18] Gervais, P., Hébert, R. and Tousignant M (2010). Methodology of the evaluation study of the implementation of the Functional Autonomy Measurement System (SMAF) in the French medico-social sector: the PISE-Dordogne study. The Journal of Geriatrics, 2010; 35: 4 235-244.

[19] Carbonnelle, S (2020). L'accueil des publics dits « autonomes » (O et A) en maison de repos : une question en débat ; L'observatoire, 104 pages (35-40), 2020.

[20] Dolbec, C. and Beaudry, D (2020). Démarche SMAF - Introduction aux profils ISO-SMAF janvier 2014 (révisé juin 2020).

[21] Dolbec, C (2016). Comment utiliser les données issues du SMAF et des profils pour supporter le gestion clinique et administrative. Décembre 2016.

[22] Dolbec, C (2020). Communication personnelle, juillet 2020.

[23] Triola, MM, and Triola, MF (2012). Biostatistique pour les sciences de la vie et de la santé, Edition Pearson.